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SONERA OYJ [/]; (). KOSKI, Jussi [/]; (). ROSTAS, Peter [/]; (). KOSKI, Jussi [/]; (). ROSTAS, Peter [/]; (). PAPULA REIN LAHTELA OY ; ().

Published

(54) **Title: PROCEDURE AND SYSTEM FOR IDENTIFYING AND BILLING A SUBSCRIBER ASSOCIATED WITH A SERVICE IN A TELECOMMUNICATION SYSTEM**

(54) **Titre: PROCEDE D'IDENTIFICATION D'ABONNE ET DE FACTURATION D'UN SERVICE DANS UN SYSTEME DE TELECOMMUNICATIONS ET DISPOSITIF CORRESPONDANT**

(57) Abstract

The present invention relates to telecommunication systems. The object of the invention is to disclose a procedure and a system for identifying and billing a subscriber associated with a service in a telecommunication system. In the procedure, the parameters associated with the service are selected by means of a second telecommunication terminal (5), which preferably is a computer connected to the Internet. Based on the parameters, a unique identifier associated with the service is generated. The identifier contains e.g. a component specifying the service and an unambiguous running numeric component. According to the invention, a message of a given format is sent by means of the first telecommunication terminal to the billing server (6) over the first telecommunication network (1) and the sender of the message is billed in accordance with the normal subscriber invoicing practice of the first telecommunication network (1).

(57) Abrégé

Cette invention, qui a trait à des systèmes de télécommunications, concerne un procédé d'identification d'abonné et de facturation d'un service dans un système de télécommunications et le dispositif correspondant. Dans le cadre de ce procédé, les paramètres associés au service sont sélectionnés par un second terminal de télécommunications (5) qui est, de préférence, un ordinateur raccordé à l'Internet. Un seul identificateur associé au service est produit d'après ces paramètres. Cet identificateur contient, par exemple, une composante précisant le service et une composante numérique non ambiguë d'exécution. Un message d'un format donné est envoyé par le premier terminal de télécommunications au serveur de facturation (6) sur le premier réseau de télécommunications (1) et l'expéditeur du message est facturé conformément à la règle de facturation normale d'abonné du premier réseau de télécommunications (1).

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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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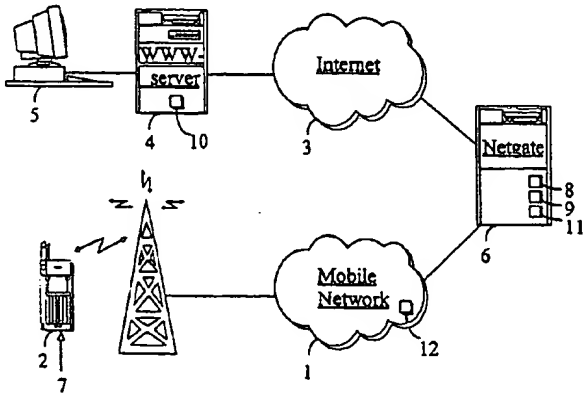

(57) Abstract

The present invention relates to telecommunication systems. The object of the invention is to disclose a procedure and a system for identifying and billing a subscriber associated with a service in a telecommunication system. In the procedure, the parameters associated with the service are selected by means of a second telecommunication terminal (5), which preferably is a computer connected to the Internet. Based on the parameters, a unique identifier associated with the service is generated. The identifier contains e.g. a component specifying the service and an unambiguous running numeric component. According to the invention, a message of a given format is sent by means of the first telecommunication terminal to the billing server (6) over the first telecommunication network (1) and the sender of the message is billed in accordance with the normal subscriber invoicing practice of the first telecommunication network (1).

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Description

Procedure and system for identifying and billing a subscriber associated with a service in a telecommunication system

FIELD OF THE INVENTION

The present invention relates to telecommunication systems. In particular, the present invention concerns a procedure and a system for identifying and billing a subscriber associated with a service in a telecommunication system.

BACKGROUND OF THE INVENTION

Telecommunication systems are undergoing continuous development. People and enterprises using telecommunication systems expect and assume that the services provided in conjunction with telecommunication systems will go on improving and growing more varied.

The Internet is a global complex of different telecommunication networks. Its basic idea is global addressing that allows each individual computer connected to it to be unambiguously located.

At present, the Internet is very popular and it is growing rapidly. There are Internet services such as electronic mail and the WWW (World Wide Web). Especially due to its ease of use and its world-wide nature, the WWW has become a global channel for the transmission of information.

The Internet has gathered around it a new channel for advertising and commerce. Various supplementary services produced in the Internet may be chargeable. Examples of this are e.g. various net publications, real-time news services, etc. The means of payment used include e.g. credit cards and electronic money. A condition for the implementation of services is that the user of a service be reliably identified

so that the bill for the service is directed to the right party. For these services to gain more widespread popularity, security of communication in different telecommunication systems must be guaranteed. An implementation associated with chargeable supplementary services is e.g. one in which the services are based on separate systems built in WWW servers in which a registered user of a service is identified on the basis of a user identifier and a personal password. The identifier and password entered by the user are compared with information stored in a user register, and after successful identification the user is given access to the actual service. The passwords may be either permanent or changeable, being based e.g. on lists of passwords or on agreed algorithms.

In the solution described above, a problem is that the user identification system built in a WWW server requires registration of service users, a separate database, customer management and password management. The TCP/IP protocol (TCP, Transport Control Protocol; IP, Internet Protocol) is susceptible to interception, which means that at least static passwords do not necessarily guarantee security. Moreover, the billing of users for service transactions has to be implemented via a separate billing system or alternatively the service has to be integrated with an existing payment system in the Internet.

The object of the present invention is to eliminate the drawbacks referred to above or at least to significantly alleviate them.

A specific object of the invention is to disclose a new type of procedure and system for providing services requiring reliable user identification for mobile telephone subscribers, preferably GSM subscribers (GSM, Global System for Mobile communications) over the Internet. Further, the invention allows the billing for a service to be integrated with an exist-

ing mobile telephone billing system. This obviates the need for implementing a separate user identification and billing system.

As for the features characteristic of the present invention, reference is made to the claims.

SUBJECT OF THE INVENTION

The procedure of the invention concerns identification and billing of a subscriber in conjunction with a service in a telecommunication system. The system of the invention preferably comprises a first telecommunication network, a first telecommunication terminal connected to the first telecommunication network, and a second telecommunication network. Moreover, the system comprises a second telecommunication terminal, which is connected to the second telecommunication network. Furthermore, the system of the invention comprises a telecommunication server connected to the second telecommunication network and a billing server connected to both the first and the second telecommunication networks.

In the procedure of the invention, using the second telecommunication terminal, a telecommunication connection is established via the telecommunication server to the second telecommunication network. This means e.g. that a connection is set up via any service provider to the second telecommunication network, e.g. the Internet. The telecommunication server is preferably a WWW server. By means of the second telecommunication terminal, which is e.g. a computer, the user selects a desired service, a possible second party associated with the service, the mode of service and other parameters relating to the service. This is accomplished e.g. by selecting a HTML page (HTML, Hyper-Text Markup Language) created for a given service. From information supplied by the user and from possible attached information, an unambiguous identifier

associated with the service in question is formed. The user sees the identifier e.g. on a new HTML page.

Based on the identifier received, using the first telecommunication terminal, the user sends a message of a given format to the billing server via the first telecommunication network. A short message is sent to a given predetermined short message number. In practice, this means e.g. that, in the case of a mobile communication network, the short message sent is first passed to a short message service center (SMS-C). The short message service center recognizes by a given part of the short message that it has to be sent further to the billing server. The short message to be sent may also contain other information relating to the service. The first telecommunication terminal is preferably a mobile station and the first telecommunication network is correspondingly a mobile communication network. If the mobile communication network is a GSM network, then the message to be sent is e.g. a SMS message (SMS, Short Message Service).

The sender of the message and the service selected by the sender are identified in the billing server on the basis of the identifier contained in the message sent. The information transmitted in the message is sufficient for the identification of the user. The sender of the message is identified e.g. on the basis of the MSISDN number (MSISDN, Mobile Station International ISDN Number) associated with an SMS message. The billing for the selected service is part of the business of the first telecommunication network. According to the invention, the billing is done in accordance with normal subscriber invoicing. If the first telecommunication network is a mobile communication network, then the user of the service is billed in conjunction with a normal mobile communication invoice.

The sender of the message can be sent a confirmation of execution of the selected service. The confirmation is sent e.g. as an SMS message or via a WWW connection.

The system comprises means for performing the functions described above.

The present invention has the advantage that chargeable Internet services can be provided for WWW users having a mobile telephone subscription, without their having to register themselves in a separate credit or digital cash system. The billing of service users can be implemented via the billing system of an existing mobile communication network, preferably a GSM network, without a separate user database and customer management.

LIST OF ILLUSTRATIONS

In the following, the invention will be described in detail by the aid of a few embodiments, wherein

Fig. 1 presents a system according to the present invention, and

Fig. 2 presents a signalling flow diagram according to the present invention.

DETAILED DESCRIPTION OF THE INVENTION

The system illustrated in Fig. 1 comprises a first telecommunication network 1, a first telecommunication terminal 2 connected to the first telecommunication network 1, and a second telecommunication network 3. Further, the system of the invention comprises a telecommunication server 4 connected to the second telecommunication network 3. Moreover, the system comprises a second telecommunication terminal 5 connected to the second telecommunication network 3

and a billing server 6 connected to both the first 1 and the second 3 telecommunication networks.

The first telecommunication terminal 2 comprises means 7 for sending a message of a given format on the basis of information contained in an identifier via the first telecommunication network 1 to the billing server 6. The billing server 6 comprises means 8 for identifying the sender of the message and/or the service associated with it in the billing server 6 on the basis of the message and/or its sender and means 9 for billing the sender of the message in accordance with the normal subscriber invoicing practice in the first telecommunication network 1. Moreover, the billing server 6 comprises means 11 for sending to the user of the service a confirmation of successful execution of the selected service in the form of an SMS message and/or over the second telecommunication network 3 via the telecommunication server 4 to the second telecommunication terminal 5 and/or in some other way.

The telecommunication server 4 comprises means 10 for adding to the identifier associated with the selected service a component identifying the service and/or a unique transaction-specific identifier and/or other information. In addition, the first telecommunication network 1 comprises means 12 for directing a received message to the billing server 6 on the basis of a predetermined identifier contained in the message.

In an embodiment as illustrated in Fig. 1, the user is sending an "electronic postcard". Using a second telecommunication terminal 5 as presented in Fig. 1, the user selects an appropriate HTML page in the WWW, e.g. the HTML page of his own mobile communication network operator. This page presents him the following alternatives: sending an electronic postcard

- to a GSM subscriber on the basis of a GSM number,

- as an electronic mail message to a given electronic mail address,
- as a printed postcard to the receiver's home address.

The page also contains a list of service charges. On the next page, the user fills in on the electronic postcard a title, a greeting text and a receiver specification and attaches to the card a desired digital picture. Having filled in the information relating to the postcard, the user confirms the transmission of the electronic postcard by means of a mobile telephone. For the transmission, the WWW server presents a new HTML page to the user. On this page, the user is asked to send a short message of a given format e.g. to the abbreviated number 400. The text message of a given format may contain e.g. a message like "Card 4275". The user sends the above-described message to a certain abbreviated number, which in this example is 400. The short message service center SMS-C of the mobile communication network directs the short message further to a server which handles short messages subject to a special charge; in the present example, this server is called Netgate. Generally, the text message of a given format contains a component identifying the service (Service ID) and a unique transaction-specific identifier (Transaction ID). The transaction-specific identifier contains possible service options and an unambiguous identifier generated by the server.

Netgate identifies the service in question by the example word "Card" (Service ID) appearing at the beginning of the message and generates a billing ticket concerning use of the service. Based on the billing ticket, the charge for the service is debited directly to the user in his mobile telephone invoice. Netgate transmits the numeric code "4275" (Transaction ID) and the user's mobile telephone number to an image

server providing a WWW service. Based on these data, the image server activates the transmission of the card.

In the GSM network, the subscriber is identified by an effective authentication mechanism when a telephone containing a SIM card (SIM, Subscriber Identity Module) connects to the GSM network. In the mobile originated SMS message, the subscriber MSISDN number, verified by the above-mentioned authentication procedure, is transmitted to the short message service center. In this example, the sender of the message is identified by the MSISDN number.

The user receives an acknowledgement of receipt of the service request in the form of an SMS message. If the transmission of the card is not activated, then the image server will delete unsent cards after a certain delay. If the numeric code in the short message is incorrect, then the user is given an error message, e.g. "The card number you sent is incorrect".

Fig. 2 presents a signalling flow diagram according to the invention. It describes the operation of the system of the invention, illustrating the communication between the various components. MS is a mobile station and "Netgate" is an example of a server providing chargeable SMS services. The lozenges in Fig. 2 represent internal processes or impulses in the components.

The user supplies the information (20a) required in the service, producing an action request to the WWW server (20). The WWW server interprets the information supplied and generates a unique transaction-specific identifier (Transaction-ID) (21a) from it. At the same time, it sends to the WWW-client a request relating to the service, containing a component identifying the service (Service ID) and a unique transaction-specific identifier (Transaction-ID). The request

also contains the short message number to which the user is asked to send a text message.

Next, the user of the mobile station sends a text message to the above-mentioned short message number (22). The text message contains a component identifying the service and a unique transaction-specific identifier. The text message is first sent to the short message service center (SMS-C) (23) of the mobile communication network, which again is able to direct it to a server taking care of specially charged services. This server, which in this example is called "Netgate", generates a billing ticket (23a) from the service. In this example, the billing for the services is performed in accordance with the normal billing practice of the mobile communication network.

The server "Netgate" sends a notice about the transaction performed to the WWW server (24). The notice contains the billed MSISDN number and the transaction-specific identifier (Transaction-ID). The WWW server recognizes the identifier sent and, based on this, performs the actions (24a) comprised in the service requested. The billing ticket CDR (CDR, Call Detailed Record) generated from the service is sent to the billing system (25). A confirmation of the billing transaction can be sent to the mobile station in the form of an SMS message (26). The service user is sent a confirmation of successful execution of the service e.g. via the WWW connection (27) and/or as a SMS message (28).

The invention is not restricted to the examples of its embodiments described above, but many variations are possible within the scope of the inventive idea defined in the claims.

Claims

CLAIMS

1. Procedure for identifying and billing a subscriber associated with a service in a telecommunication system comprising

a first telecommunication network (1),

a first telecommunication terminal (2), which is connected to the first telecommunication network (1),

a second telecommunication network (3),

a telecommunication server (4), which is connected to the second telecommunication network (3),

a second telecommunication terminal (5), which is connected to the telecommunication server (4),

a billing server (6), which is connected to the first and the second telecommunication networks (1,3),

said procedure comprising the steps of:

establishing a telecommunication connection by means of the second telecommunication terminal (5) via the telecommunication server (4) to the second telecommunication network (3),

selecting by means of the second telecommunication terminal (5) a desired service, a possible second party associated with the service, the mode of service and other parameters relating to the service,

generating on the basis of this information an unambiguous identifier associated with the selected service for the service user,

c h a r a c t e r i z e d in that the procedure comprises the steps of:

sending on the basis of the information contained in the identifier a message of a given format to the billing server (6) over the first telecommunication network (1) by means of the first telecommunication terminal (2);

identifying in the billing server (6) the sender of the message and/or the service associated with the message on the basis of the message and/or its sender; and

billing the sender of the message in accordance with the normal invoicing practice of the first telecommunication network (1).

2. Procedure as defined in claim 1, characterized in that a component identifying the service and/or a unique transaction-specific identifier and/or other information is added to the identifier associated with the selected service.

3. Procedure as defined in claim 1 or 2, characterized in that the message sent to the billing server (6) on the basis of the information contained in the identifier by means of the first telecommunication terminal (2) over the first telecommunication network (1) is sent in the form of an SMS message.

4. Procedure as defined in any one of claims 1 - 3, characterized in that the sender of the message is identified in the billing server (6) on the basis of the MSISDN number.

5. Procedure as defined in any one of claims 1 - 4, characterized in that a confirmation of successful execution of the service is sent to the user of the service.

6. Procedure as defined in any one of claims 1 - 5, characterized in that the confirmation of successful execution of the selected service is sent to the service user in the form of an SMS message and/or over the second telecommunication network (3) via the telecommunication server (4) to the second telecommunication terminal (5).

7. Procedure as defined in any one of claims 1 - 6, characterized in that the message received in the first telecommunication network (1) is directed to the billing server (6) on the basis of the predetermined identifier contained in the message.

8. System for identifying and billing a subscriber associated with a service in a telecommunication system comprising

a first telecommunication network (1),

a first telecommunication terminal (2), which is connected to the first telecommunication network (1),

a second telecommunication network (3),

a telecommunication server (4), which is connected to the second telecommunication network (3),

a second telecommunication terminal (5), which is connected to the telecommunication server (4),

a billing server (6), which is connected to the first and the second telecommunication networks (1,3),

said procedure comprising the steps of:

establishing a telecommunication connection by means of the second telecommunication terminal (5) via the telecommunication server (4) to the second telecommunication network (3),

selecting by means of the second telecommunication terminal (5) a desired service, a possible second party associated with the service, the mode of service and other parameters relating to the service,

generating on the basis of this information an unambiguous identifier associated with the selected service for the service user,

characterized in that the system comprises:

means (7) for sending on the basis of the information contained in the identifier a message of a given format to the billing server (6) over the first telecommunication network (1) by means of the first telecommunication terminal (2);

means (8) for identifying in the billing server (6) the sender of the message and/or the service associated with the message on the basis of the message and/or its sender; and

means (9) for billing the sender of the message in accordance with the normal invoicing practice of the first telecommunication network (1).

9. System as defined in claim 8, characterized in that the system comprises means (10) for adding a component identifying the service and/or a unique transaction-specific identifier and/or other information to the identifier associated with the selected service.

10. System as defined in claim 8 or 9, characterized in that the billing server (6) comprises means (8) for authenticating the sender of the message on the basis of the MSISDN number.

11. System as defined in any one of claims 8 - 10, characterized in that the system comprises means (11) for sending a confirmation of successful execution of the selected service to the service user in the form of an SMS message and/or over the second telecommunication network (3) via the telecommunication server (4) to the second telecommunication terminal (5) or in some other way.

12. System as defined in any one of claims 8 - 11, characterized in that the system comprises means (12) for directing the message received in the first telecommunication network (1) to the billing server (6) on the basis of a predetermined identifier contained in the message.

13. System as defined in any one of claims 8 - 12, characterized in that the first telecommunication network (1) is a mobile communication network.

14. System as defined in any one of claims 8 - 13, characterized in that the second telecommunication network (3) is the Internet.

15. System as defined in any one of claims 8 - 14, characterized in that the first telecommunication terminals (2) is a mobile station.

16. System as defined in any one of claims 8 - 15, characterized in that the second telecommunication terminal (5) is a computer.

17. System as defined in any one of claims 8 - 16, characterized in that the telecommunication server (4) is a WWW server.

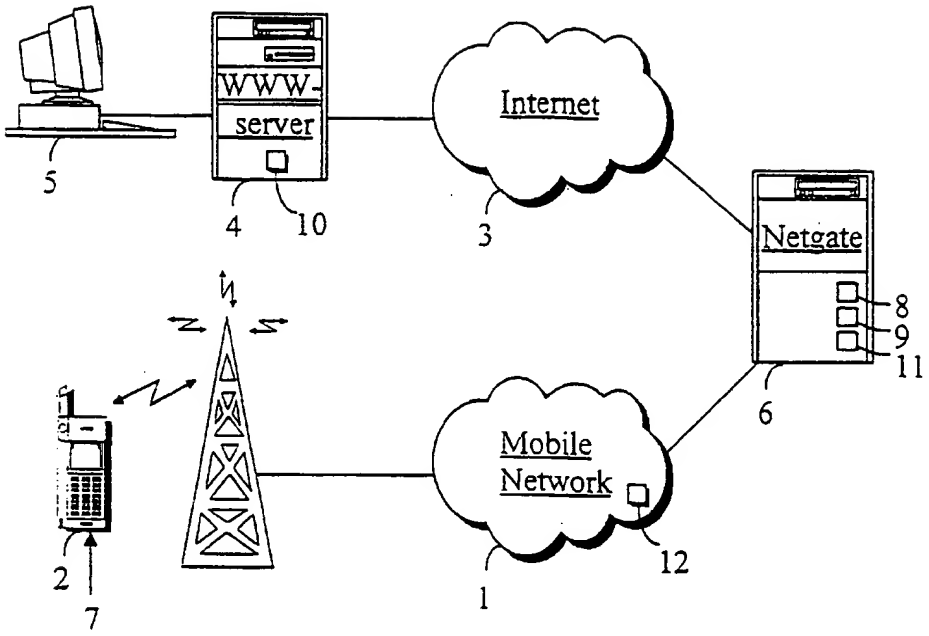
WWW-
server
Internet
Netgate
Mobile
Network
5
4
10
3
8
9
11
6
12
1
2
7

Fig. 1

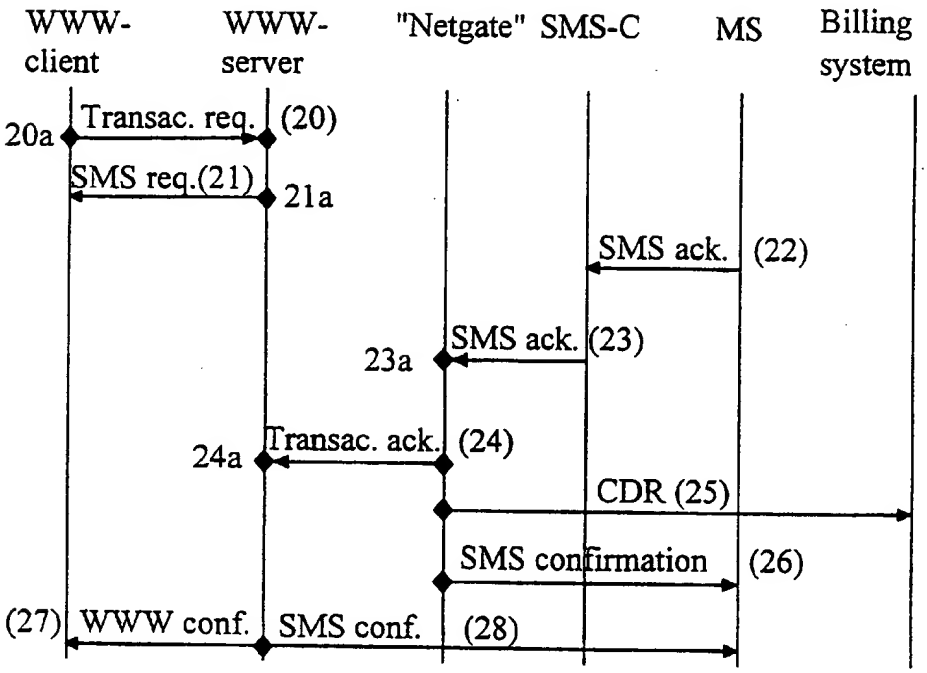
WWW-client
WWW-server
"Netgate"
SMS-C
MS
Billing system
20a
Transac. req.
(20)
SMS req.(21)
21a
SMS ack.
(22)
SMS ack.
(23)
23a
24a
Transac. ack.
(24)
CDR (25)
SMS confirmation
(26)
(27)
WWW conf.
SMS conf.
(28)

Fig. 2

INTERNATIONAL SEARCH REPORT

International application No.
PCT/FI 99/00902

A. CLASSIFICATION OF SUBJECT MATTER

IPC7: H04L 12/22, H04M 15/00, G06F 17/60, G07F 7/10
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC7: G06F, G07F, H04L, H04M, H04Q

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

SE,DK,FI,NO classes as above

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	WO 9901990 A2 (SONERA OY), 14 January 1999 (14.01.99), page 3, line 10 - page 4, line 10; page 5, line 27 - page 6, line 30, figure 1	1,7,8,12-17
P,Y	--	3-6,10,11
Y	WO 9731306 A1 (NOKIA MOBILE PHONES LTD.), 28 August 1997 (28.08.97), page 4, line 18 - page 6, line 33, figure 2	3-6,10,11
	--	
A	CA 2161983 A1 (ASSAD, ELIAS), 3 May 1997 (03.05.97), see whole document	1-17
	--	

[X] Further documents are listed in the continuation of Box C. [X] See patent family annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
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Name and mailing address of the ISA/ Swedish Patent Office Box 5055, S-102 42 STOCKHOLM Facsimile No. +46 8 666 02 86	Authorized officer Jenny Eriksson/cs Telephone No. +46 8 782 25 00

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INTERNATIONAL SEARCH REPORT

International application No.
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